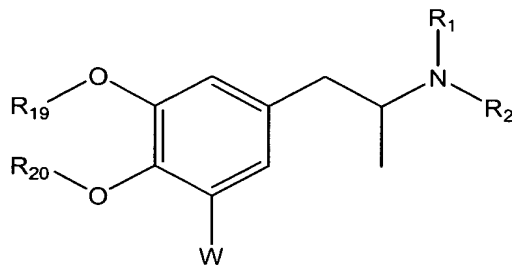


WHAT IS CLAIMED IS:

1. A compound of the formula:



Formula I

wherein:  $R^{19}$  is lower alkyl or is taken together with  $R^{20}$  to form a ring, which may be a five- or six-member ring, usually a five-member ring;

$R^{20}$  is lower alkyl, or is taken together with  $R^{19}$  to form a ring as discussed above,

$R^1$  is H or lower alkyl,

$R^2$  is H, lower alkyl, a protecting group or

- (a)  $-(CH_2)_aC(O)(CH_2)_bSR^3$ , wherein a is 0 to 5, b is 1 to 5 and  $R^3$  is H or lower alkyl or  $(CH_2)_cC(O)NR^4R^5$  wherein  $R^4$  is H or lower alkyl and  $R^5$  is H, an immunogenic carrier or a label, or
- (b)  $(A)_d(Q)_n$  wherein Q is H or  $-(CH_2)_eCH(R^8)(CH_2)_fOC(O)(CH_2)_gR^9$  being H only when d is 1 wherein A is  $-C(O)(CH_2)_hC(O)NR^{10}((CH_2)_jO(CH_2)_kO)_m(CH_2)_2NR^{11}-$  d is 0 or 1, n is 0 or 1 wherein one of d or n is 1, h is 1 to 5,  $R^{10}$  is H or lower alkyl, j is 1 to 5, k is 1 to 5, m is 1 to 3,  $R^{11}$  is H or lower alkyl, e is 1 to 5,  $R^8$  is OH or H, f is 1 to 5, g is 0 to 5, and  $R^9$  is H, an immunogenic carrier or a label;

W is H or  $JR^{14}$  being H when  $R^2$  is other than H or lower alkyl, wherein

J is O or S,

$R^{14}$  is H, lower alkyl, a protecting group, or

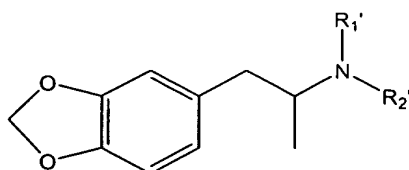
- $-(CH_2)_rC(O)NR^{15}(CH_2)_s(D)_tR^{16}$ , wherein r is 1 to 5,  $R^{15}$  is H or lower alkyl, s is 1 to 5, D is S, O or N, t is 0 or 1 being 0 when  $R^{16}$  is maleimidyl or succinimidyl,  $R^{16}$  is H, maleimidyl, succinimidyl, or  $-(CH_2)_qC(O)NR^{17}R^{18}$ ,

q is 1 to 5,

$R^{17}$  is H or lower alkyl,  
 $R^{18}$  is H, lower alkyl, an immunogenic carrier or label,  
 and including the acid salts thereof.

- 5           2.       A compound according to Claim 1 wherein  $R^1$  is H and  $R^2$  is H.
3.       A compound according to Claim 1 wherein  $R^1$  is H and  $R^2$  is lower alkyl.
4.       A compound according to Claim 3 wherein  $R^{16}$  is  $-(CH_2)_qC(O)NR^{17}R^{18}$   
 10      and  $R^{18}$  is a poly(amino acid).
6.       A compound according to Claim 1 wherein  $R^1$  is H or lower alkyl, W is  
 H and  $R^2$  is  $-(CH_2)_aC(O)(CH_2)_bSR^3$ , wherein  $R^3$  is  $-(CH_2)_cC(O)NR^4R^5$  wherein  $R^4$  is H  
 or lower alkyl and  $R^5$  is a poly(amino acid).
- 15           7.       A compound according to Claim 1 wherein  $R^1$  is H or lower alkyl, W is  
 H and  $R^2$  is  $-(CH_2)_aC(O)(CH_2)_bSR^3$ , wherein  $R^3$  is  $-(CH_2)_cC(O)NR^4R^5$  wherein  $R^4$  is H  
 or lower alkyl and  $R^5$  is an immunogenic carrier.
- 20           8.       A compound according to Claim 1 wherein  $R^1$  is H or lower alkyl, W is  
 H and  $R^2$  is  $(A)_d(Q)_n$  wherein d is 0, n is 1, Q is  $-(CH_2)_eCH(R^8)(CH_2)_fOC(O)(CH_2)_gR^9$   
 and  $R^9$  is a poly(amino) acid.
9.       A compound according to Claim 1 wherein  $R^1$  is H or lower alkyl, W is  
 25      H and  $R^2$  is  $(A)_d(Q)_n$  wherein d is 1, n is 1, Q is  $-(CH_2)_eCH(R^8)(CH_2)_fOC(O)(CH_2)_gR^9$   
 and A is  $-C(O)(CH_2)_hC(O)NR^{10}((CH_2)_jO(CH_2)_kO)_m(CH_2)_2NR^{11}-$ , and  $R^9$  is a  
 poly(amino) acid.

- 30           10.      A compound of the formula:



Formula II

wherein:  $R^{1'}$  is H, lower alkyl or a protecting group,  
 $R^{2'}$  is a protecting group, or

- (a)  $-(CH_2)_aC(O)(CH_2)_bSR^{3'}$ , wherein a is 0 to 5, b is 1 to 5 and  $R^{3'}$  is H or lower alkyl or  $(CH_2)_cC(O)NR^{4'}R^{5'}$  wherein  $R^{4'}$  is H or lower alkyl and  $R^{5'}$  is H, an immunogenic carrier or a label, or
- (b)  $(A)_d(Q)_n$  wherein Q is H or  $-(CH_2)_eCH(R^{8'})(CH_2)_fOC(O)(CH_2)_gR^{9'}$  being H only when d is 1 wherein A is  $-C(O)(CH_2)_hC(O)NR^{10}((CH_2)_jO(CH_2)_kO)_m(CH_2)_2NR^{11}-$  d is 0 or 1, n is 0 or 1 wherein one of d or n is 1, h is 1 to 5,  $R^{10}$  is H or lower alkyl, j is 1 to 5, k is 1 to 5, m is 1 to 3,  $R^{11}$  is H or lower alkyl, e is 1 to 5,  $R^{8'}$  is OH or H, f is 1 to 5, g is 0 to 5, and  $R^{9'}$  is H, an immunogenic carrier or a label, and including the acid salts thereof.

11. A compound according to Claim 10 wherein  $R^{1'}$  is H or lower alkyl and  $R^{2'}$  is  $-(CH_2)_aC(O)(CH_2)_bSR^3$  wherein a is 0, b is 1,  $R^3$  is H.

12. A compound according to Claim 10 wherein  $R^{1'}$  is H or lower alkyl and  $R^{2'}$  is  $-(CH_2)_aC(O)(CH_2)_bSR^{3'}$  wherein a is 0, b is 1,  $R^{3'}$  is  $(CH_2)_cC(O)NR^{4'}R^{5'}$  wherein c is 1,  $R^{4'}$  is H and  $R^{5'}$  is a poly(amino) acid.

13. A compound according to Claim 12 wherein said poly(amino) acid is an enzyme or an immunogen.

14. A compound according to Claim 10 wherein  $R^{1'}$  is H or lower alkyl and  $R^{2'}$  is  $-(CH_2)_aC(O)(CH_2)_bSR^{3'}$  wherein a is 0, b is 1,  $R^{3'}$  is  $(CH_2)_cC(O)NR^{4'}R^{5'}$  wherein c is 1,  $R^{4'}$  is H and  $R^{5'}$  is an immunogenic carrier.

15. A compound according to Claim 10 wherein  $R^{1'}$  is H or lower alkyl and  $R^{2'}$  is  $-(CH_2)_aC(O)(CH_2)_bSR^{3'}$  wherein a is 0, b is 1,  $R^{3'}$  is  $(CH_2)_cC(O)NR^{4'}R^{5'}$  wherein c is 1,  $R^{4'}$  is H and  $R^{5'}$  is a particle.

16. A compound according to Claim 10 wherein  $R^{1'}$  is H or lower alkyl and  $R^{2'}$  is  $(A)_d(Q)_n$  wherein d is 0, n is 1, Q is  $-(CH_2)_eCH(R^{8'})(CH_2)_fOC(O)(CH_2)_gR^{9'}$ , e is 1,  $R^{8'}$  is OH, f is 1, g is 0 and  $R^{9'}$  is a poly(amino) acid.

17. A compound according to Claim 16 wherein said poly(amino) acid is an enzyme or an immunogen.

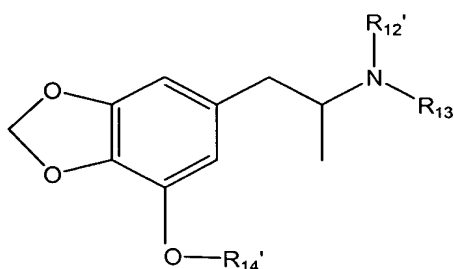
18. A compound according to Claim 10 wherein  $R^{1'}$  is H or lower alkyl and  
 5  $R^{2'}$  is  $(A)_d(Q)_n$  wherein d is 0, n is 1, Q is H, A is  
 $-C(O)(CH_2)_hC(O)NR^{10'}((CH_2)_jO(CH_2)_kO)_m(CH_2)_2NR^{11'}$ ,  $R^{10'}$  is H, h is 2, m is 1, j is 2, k  
 is 2,  $R^{10'}$  is H.

19. A compound according to Claim 10 wherein  $R^{1'}$  is H or lower alkyl and  
 10  $R^{2'}$  is  $(A)_d(Q)_n$  wherein d is 1, n is 1, Q is  $-(CH_2)_eCH(R^{8'})-(CH_2)_fOC(O)(CH_2)_gR^{9'}$ , e is  
 1,  $R^{8'}$  is OH, f is 1, g is 0, A is  
 $-C(O)(CH_2)_hC(O)NR^{10'}((CH_2)_jO(CH_2)_kO)_m(CH_2)_2NR^{11'}$ ,  $R^{10'}$  is H, h is 2, m is 1, j is 2, k  
 is 2,  $R^{10'}$  is H and  $R^{9'}$  is a poly(amino) acid or a particle.

20. A compound according to Claim 19 wherein  $R^{9'}$  is a poly(amino) acid,  
 which is an enzyme or an immunogen.

21. A compound according to Claim 19 wherein  $R^{9'}$  is a particle

22. A compound of the formula:



Formula III

25 wherein:  $R^{12'}$  is H or lower alkyl,  
 $R^{13'}$  is H or lower alkyl,  
 $R^{14'}$  is a protecting group, or  $-(CH_2)_rC(O)NR^{15'}(CH_2)_s(D)_tR^{16'}$ , wherein r  
 is 1 to 5,  $R^{15'}$  is H or lower alkyl, s is 1 to 5, D is S, O or N, t is 0 or 1 being 0

when  $R^{16'}$  is maleimidyl or succinimidyl,  $R^{16'}$  is H, a protecting group, maleimidyl or succinimidyl, or  $-(CH_2)_qC(O)NR^{17'}R^{18'}$ ,

$R^{17'}$  is H, lower alkyl or a protecting group,

$R^{18'}$  is H, lower alkyl, a protecting group, an immunogenic carrier or

5 label,

and including salts thereof.

23. A compound according to Claim 22 wherein  $R^{12'}$  is H and  $R^{13'}$  is H or lower alkyl,  $R^{14'}$  is  $-(CH_2)_rC(O)NR^{15'}(CH_2)_s(D)_tR^{16'}$ , wherein r is 1,  $R^{15'}$  is H, s is 2, D is S, t is 1 and  $R^{16'}$  is H.

24. A compound according to Claim 22 wherein  $R^{12'}$  is H and  $R^{13'}$  is H or lower alkyl,  $R^{14'}$  is  $-(CH_2)_rC(O)NR^{15'}(CH_2)_s(D)_tR^{16'}$ , wherein r is 1,  $R^{15'}$  is H, s is 2, t is 0 and  $R^{16'}$  is succinimidyl or maleimidyl.

25. A compound according to Claim 22 wherein  $R^{12'}$  is H and  $R^{13'}$  is H or lower alkyl,  $R^{14'}$  is  $-(CH_2)_rC(O)NR^{15'}(CH_2)_s(D)_tR^{16'}$ , wherein r is 1,  $R^{15'}$  is H, s is 2, D is S, t is 1 and  $R^{16'}$  is  $-(CH_2)_qC(O)NR^{17'}R^{18'}$ , q is 1,  $R^{17'}$  is H and  $R^{18'}$  is a poly(amino) acid or a particle.

26. A compound according to Claim 25 wherein  $R^{18'}$  is a particle.

27. An antibody raised against a compound according to Claim 17 wherein said poly(amino) acid is an immunogen..

28. An antibody raised against a compound according to Claim 20 wherein said poly(amino) acid is an immunogen..

29. An antibody raised against a compound according to Claim 25 wherein  $R^{17'}$  is a poly(amino) acid, which is an immunogen..

30. A reagent system comprising a compound according to Claim 17 wherein said poly(amino) acid is an enzyme, an antibody for methylenedioxymphetamine

and/or an antibody for methylenedioxymethamphetamine and/or an antibody for methylenedioxyethamphetamine.

31. A reagent system comprising a compound according to Claim 20 wherein  
 5 said poly(amino) acid is an enzyme, an antibody for methylenedioxyamphetamine and/or an antibody for methylenedioxymethamphetamine and/or an antibody for methylenedioxyethamphetamine.

32. A reagent system comprising a compound according to Claim 25 wherein  
 10 R<sup>17</sup>, is a poly(amino) acid, which is an enzyme, an antibody for methylenedioxyamphetamine and/or an antibody for methylenedioxymethamphetamine and/or an antibody for methylenedioxyethamphetamine.

33. A method for determining methylenedioxyamphetamine and/or  
 15 methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine, said method comprising:

20 (a) providing in combination in a medium:  
     (i) said sample and  
     (ii) a reagent system according to Claim 30; and  
     (b) examining said medium for the presence of a complex comprising said  
 25 methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine, the presence thereof indicating the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said sample.

30 34. A method according to Claim 33 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said sample.

35. A method according to Claim 34 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

36. A method according to Claim 34 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

37. A method for determining methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or methylenedioxy-methamphetamine and/or methylenedioxyethamphetamine, said method comprising:

(a) providing in combination in a medium:

(i) said sample and

(ii) a reagent system according to Claim 31; and

(b) examining said medium for the presence of a complex comprising said methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine and/or a complex of said methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine, the presence thereof indicating the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said sample.

38. A method according to Claim 37 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylene-dioxyethamphetamine in said sample.

39. A method according to Claim 38 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

40. A method according to Claim 38 wherein said method is a heterogeneous

method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

41. A method for determining methylenedioxyamphetamine and/or  
5 methylenedioxymethamphetamine in a sample suspected of containing  
methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or  
methylene-dioxyethamphetamine, said method comprising:

- (a) providing in combination in a medium:
  - (i) said sample and
  - 10 (ii) a reagent system according to Claim 32; and
- (b) examining said medium for the presence of a complex comprising said  
methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or  
a complex of said methylenedioxymethamphetamine and said antibody for  
methylenedioxymethamphetamine and/or a complex of said  
15 methylenedioxymethamphetamine and said antibody for  
methylenedioxymethamphetamine, the presence thereof indicating the presence of said  
methylenedioxyamphetamine and/or methylenedioxymethamphetamine in said sample.

42. A method according to Claim 41 wherein said examining comprises  
20 measuring signal from said enzyme, the amount thereof being related to the presence of  
said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or  
methylene-dioxyethamphetamine in said sample.

43. A method according to Claim 42 wherein said method is a homogeneous  
25 method and said medium is examined for the amount of said signal.

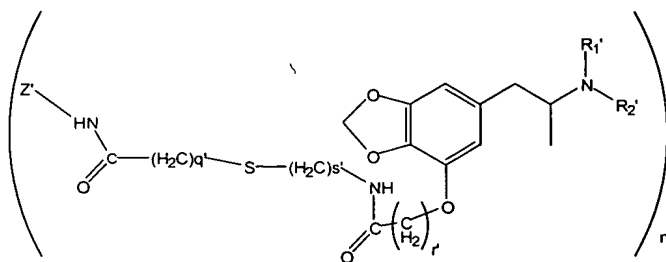
44. A method according to Claim 42 wherein said method is a heterogeneous  
method and said complex, if present, is separated from said medium and said medium or  
said complex is examined for the amount of said signal.

30

45. A method for determining amphetamine and/or methamphetamine and/or  
methylenedioxyethamphetamine in a sample suspected of containing

methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylene-dioxyethamphetamine, said method comprising:

- (a) providing in combination in a medium:
  - (i) said sample,
  - (ii) an antibody for methylenedioxyamphetamine, and/or
  - (iii) an antibody for methylenedioxymethamphetamine, and/or
  - (iv) an antibody for methylenedioxyethamphetamine, and
  - (v) a compound of the formula:



wherein:

$R^{1'}$  is H,

$R^{2'}$  is H, methyl or ethyl,

$r'$  is 1 to 5,

$s'$  is 1 to 5,

$q'$  is 1 to 5,

$Z'$  is an enzyme,

$n'$  is an integer between 1 and the molecular weight of said enzyme divided by about 500; and

- (b) examining said medium for the presence of a complex comprising said methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine and/or a complex of said methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine, the presence thereof indicating the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said sample.

46. A method according to Claim 45 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylene-dioxyethamphetamine in said sample.

5

47. A method according to Claim 46 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

48. A method according to Claim 46 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

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49. A method according to Claim 45 wherein said enzyme is glucose-6-phosphate dehydrogenase.

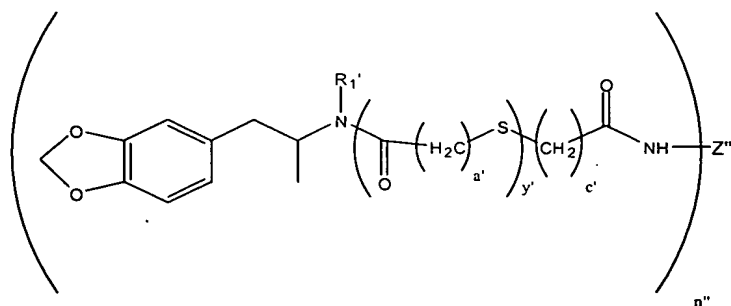
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50. A method for determining methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine, said method comprising:

20

- (a) providing in combination in a medium:
  - (i) said sample,
  - (ii) an antibody for methylenedioxyamphetamine, and/or
  - (iii) an antibody for methylenedioxymethamphetamine, and/or
  - (iv) an antibody for methylenedioxyethamphetamine, and
  - (v) a compound of the formula:

25



wherein:

R<sup>1'</sup> is H, or methyl, or ethyl,

a' is 1 to 5,

y' is 1,

5 Z' is an enzyme,

c' is 1 to 5,

n' is an integer between 1 and the molecular weight of said enzyme divided by about 500; and

(b) examining said medium for the presence of a complex comprising said  
10 methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or  
a complex of said methylenedioxymethamphetamine and said antibody for  
methylenedioxymethamphetamine and/or a complex of said  
methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine,  
the presence thereof indicating the presence of said methylenedioxyamphetamine and/or  
15 methylenedioxymethamphetamine and/or methylenedioxymethamphetamine in said  
sample.

51. A method according to Claim 50 wherein said examining comprises  
measuring signal from said enzyme, the amount thereof being related to the presence of  
20 said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or  
methylenedioxyethamphetamine in said sample.

52. A method according to Claim 51 wherein said method is a homogeneous  
method and said medium is examined for the amount of said signal.

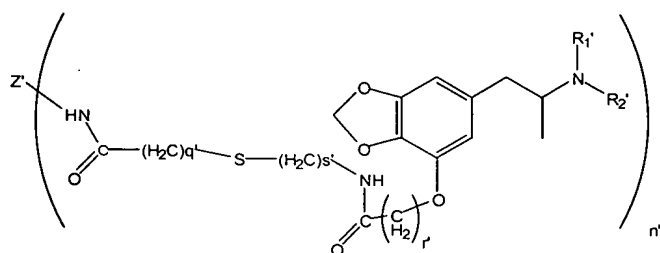
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53. A method according to Claim 51 wherein said method is a heterogeneous  
method and said complex, if present, is separated from said medium and said medium or  
said complex is examined for the amount of said signal.

30 54. A method according to Claim 50 wherein said enzyme is glucose-6-  
phosphate dehydrogenase.

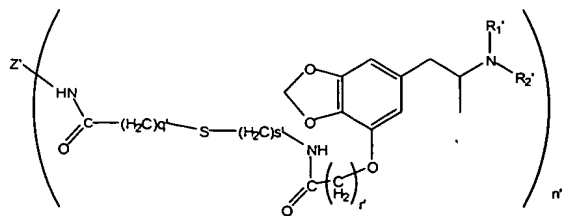
55. A method for determining methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine, said method comprising:

- (a) providing in combination in a medium:
- (i) said sample,
  - (ii) conjugate of an enzyme and a methylenedioxyamphetamine analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog and/or a conjugate of an enzyme and a methylenedioxyethamphetamine analog,
  - (iii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



wherein:

- $R^{1'}$  is H,
- $R^{2'}$  is H,
- $r'$  is 1 to 5,
- $s'$  is 1 to 5,
- $q'$  is 1 to 5,
- $Z'$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,
- $n''$  is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or
- (iv) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$  is H,

$R^{2'}$  is methyl,

$r'$  is 1 to 5,

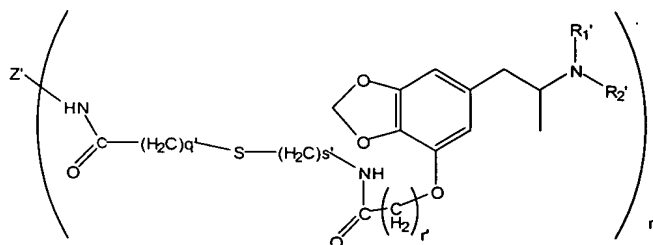
5  $s'$  is 1 to 5,

$q'$  is 1 to 5,

$Z'$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

$n''$  is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

10 (v) an antibody for methylenedioxyethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$  is H,

15  $R^{2'}$  is ethyl,

$r'$  is 1 to 5,

$s'$  is 1 to 5,

$q'$  is 1 to 5,

$Z'$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

20  $n''$  is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and

(b) examining said medium for the presence of a complex comprising said methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine and/or a complex of said  
25 methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine, the presence thereof indicating the presence of said methylenedioxyamphetamine and/or

methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said sample.

56. A method according to Claim 55 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said sample.

57. A method according to Claim 56 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

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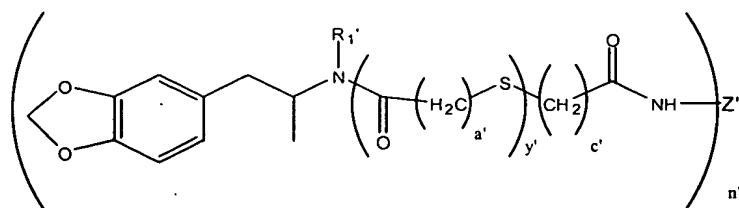
58. A method according to Claim 56 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

15

58. A method according to Claim 55 wherein said enzyme is glucose-6-phosphate dehydrogenase.

59. A method for determining methylenedioxyamphetamine and/or methylenedioxymethamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or methylenedioxymethamphetamine, said method comprising:

- (a) providing in combination in a medium:
- (i) said sample,
  - (ii) a conjugate of an enzyme and an methylenedioxyamphetamine analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog and/or a conjugate of an enzyme and a methylenedioxyethamphetamine analog,
  - (iii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$  is H,

$a'$  is 1 to 5,

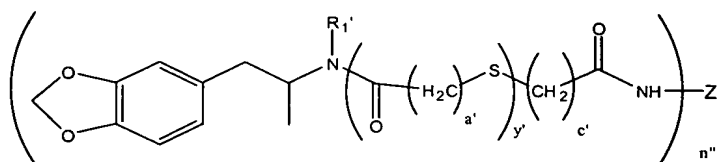
$y'$  is 1,

5  $Z''$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

$c'$  is 1 to 5,

$n''$  is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

10 (iv) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$  is methyl,

$a'$  is 1 to 5,

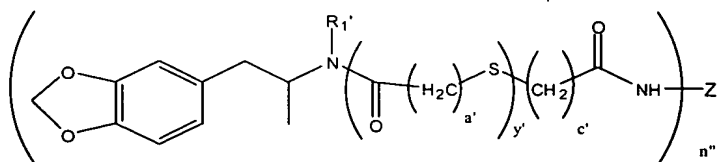
15  $y'$  is 1,

$Z''$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

$c'$  is 1 to 5,

$n''$  is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

20 (v) an antibody for methylenedioxyethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$  is ethyl,

25  $a'$  is 1 to 5,

$y'$  is 1,

$Z''$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

$c'$  is 1 to 5,

n" is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and

(b) examining said medium for the presence of a complex comprising said methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or  
 5 a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine and/or a complex of said methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine, the presence thereof indicating the presence of said amphetamine and/or methamphetamine and/or methylenedioxyethamphetamine in said sample.

10

60. A method according to Claim 59 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said sample.

15

61. A method according to Claim 60 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

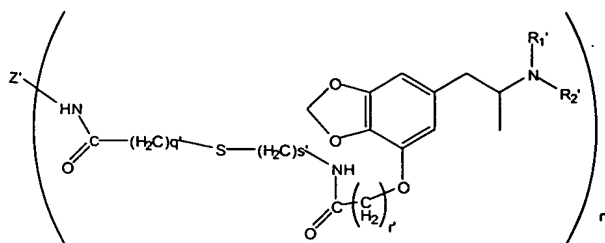
62. A method according to Claim 60 wherein said method is a heterogeneous  
 20 method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

25

63. A method according to Claim 59 wherein said enzyme is glucose-6-phosphate dehydrogenase.

30

64. A kit comprising in packaged combination:  
 (i) an antibody for methylenedioxyamphetamine, and/or  
 (ii) an antibody for methylenedioxymethamphetamine, and/or  
 (iii) an antibody for methylenedioxyethamphetamine, and  
 (iv) a compound of the formula:



wherein:

R<sup>1'</sup> is H,

R<sup>2'</sup> is H, methyl, or ethyl,

5 r' is 1 to 5,

s' is 1 to 5,

q' is 1 to 5,

Z' is an enzyme,

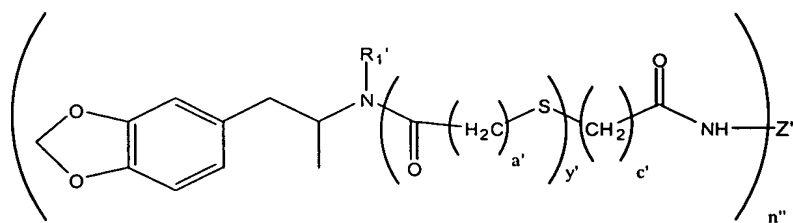
10 n' is an integer between 1 and the molecular weight of said enzyme divided by about 500.

65. A kit according to Claim 64 wherein said enzyme is glucose-6-phosphate dehydrogenase.

15 66. A kit comprising in packaged combination:

- (i) an antibody for methylenedioxyamphetamine,
- (ii) an antibody for methylenedioxymethamphetamine, and/or
- (iii) an antibody for methylenedioxyethamphetamine, and
- (iv) a compound of the formula:

20



wherein:

R<sup>1'</sup> is H, methyl or ethyl,

a' is 1 to 5, usually 1,

25 y' is 0 or 1,

Z' is an enzyme,

c' is 1 to 5,

n' is an integer between 1 and the molecular weight of said enzyme divided by about 500.

5

67. A kit according to Claim 66 wherein said enzyme is glucose-6-phosphate dehydrogenase.

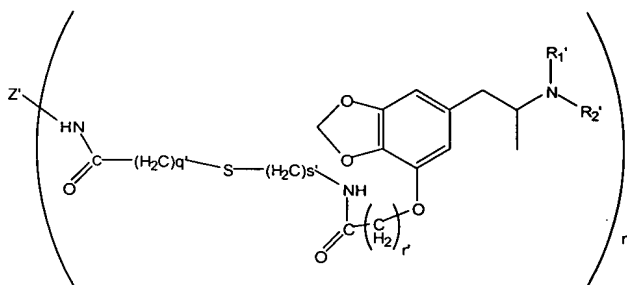
68. A kit comprising in packaged combination:

10

(i) a conjugate of an enzyme and a methylenedioxyamphetamine analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog, and/or a conjugate of an enzyme and a methylenedioxyethamphetamine analog, and

15

(ii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



wherein:

R<sup>1'</sup> is H,

R<sup>2'</sup> is H,

20

r' is 1 to 5,

s' is 1 to 5,

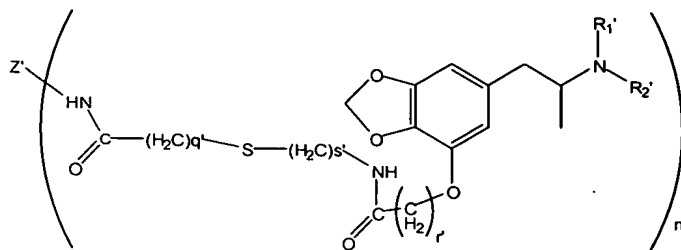
q' is 1 to 5,

Z' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

25

n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

(iii) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$  is H,

5  $R^{2'}$  is methyl,

$r'$  is 1 to 5,

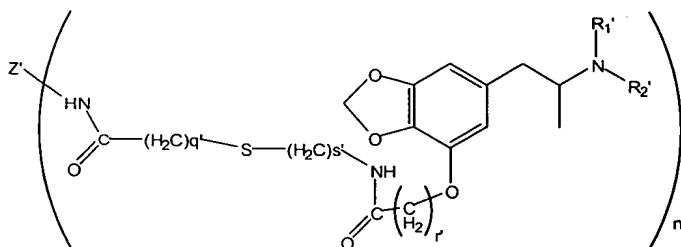
$s'$  is 1 to 5,

$q'$  is 1 to 5,

$Z'$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

10  $n''$  is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500, and/or

(iv) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



15

wherein:

$R^{1'}$  is H,

$R^{2'}$  is ethyl,

$r'$  is 1 to 5,

20  $s'$  is 1 to 5,

$q'$  is 1 to 5,

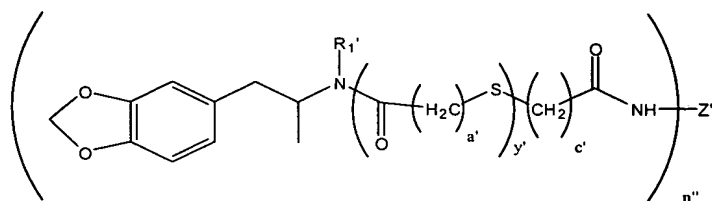
$Z'$  is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

$n''$  is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500.

69. A kit comprising in packaged combination:

(i) a conjugate of an enzyme and an methylenedioxyamphetamine analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog, and

5 (ii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



wherein:

10 R<sup>1'</sup> is H,

a' is 1 to 5,

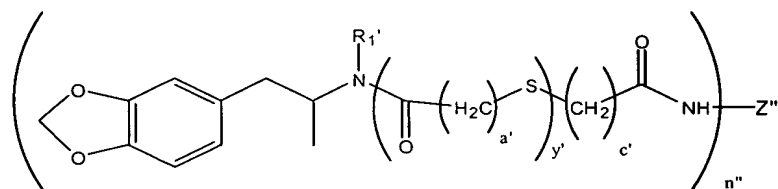
y' is 0 or 1, usually 1,

Z'' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

c' is 1 to 5,

15 n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

(iii) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



20 wherein:

R<sup>1'</sup> is methyl,

a' is 1 to 5,

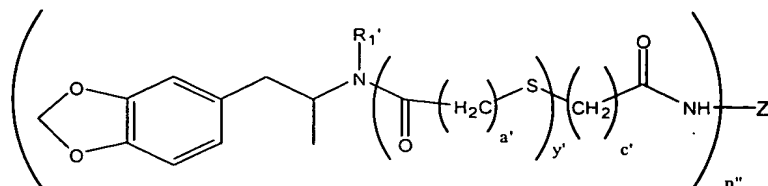
y' is 0 or 1, usually 1,

Z'' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

25 c' is 1 to 5,

n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500, and/or

(iv) an antibody for methylenedioxyethamphetamine, said antibody being raised against a compound of the formula:



wherein:

R<sup>1'</sup> is ethyl,

a' is 1 to 5,

y' is 0 or 1, usually 1,

Z'' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

c' is 1 to 5,

n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500.

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